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PUBLIC LANDS PROJECT: DOE AND IOGCC WORKING TOGETHER

by Deborah A. Pratt, BDM-Oklahoma

The U.S. Dept. of Energy (DOE) and the Interstate Oil and Gas Compact Commission (IOGCC) have undertaken a comprehensive effort to coordinate the state and federal requirements that govern exploration and production of petroleum resources on public lands.

Called the *Public Lands Project*, this effort began in 1994 with a pilot program that focused on four states: California, Wyoming, Colorado, and New Mexico. These states were

chosen because of their vast amounts of public land with petroleum potential. The main goals of the project are to shorten the time devoted to regulatory procedures by one-half and to reduce the paperwork involved in accessing petroleum resources on public lands. All four states involved in the project pledged to work toward making state paperwork requirements parallel those of the federal government whenever possible.

Continued on page 2

This newsletter features oil- and gas-related projects implemented through the DOE's oil and gas environmental research program. BDM-Oklahoma, Inc., as management and operating contractor of the National Oil Program, assists DOE in reaching its objectives.

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THE PUBLIC LANDS CORE WORKING GROUP

A key component of the success of the Public Lands Project is its *Core Working Group* (CWG), a committee interested in petroleum exploration and production on public land. The ongoing goal of CWG is to identify problems and suggest cost-effective, common-sense solutions.

CWG represents state agencies that regulate petroleum in participating states, national environmental groups active in oil and gas issues, and petroleum companies that work with public lands production on a regular basis. Official Observers provide background information and offer support and guidance to CWG. Official Observers represent a number of federal agencies, including the Department of the Interior (DOI), the Environmental Protection Agency (EPA), the Bureau of Land Management (BLM), the Minerals Management Service (MMS), the U.S. Forest

Service (USFS), and DOE.

CWG does not actually have the authority to implement any of its recommendations – the value of CWG's work can be realized only with the backing of state and federal decision-makers and the public. Still, DOE trusts that by supporting the working group process, this sensible approach to “reinventing government” will achieve success and be used in the future to address other, equally vital issues.

CWG PRIORITIES

The initial priority of CWG was to identify the flow of federal government-required paperwork pertaining to exploration and production on public lands and to compare these with state-required procedures for the same activities. This process identified a number of problem areas and suggested changes to correct them. CWG has developed consolidated, standardized forms that satisfy the requirements of states and the BLM while

CWG ACTIONS

Problem Areas

- Lack of standardized forms
- Duplicate inspections

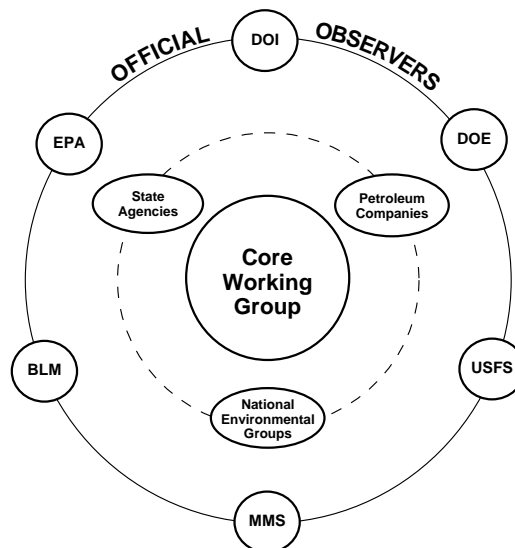
Results

- Streamlined forms
- Memoranda of Understanding
- Favorable reception by DOI

simplifying common processes. Included among the streamlined forms that have been developed and adopted by CWG are the Application to Drill (APD), Sundry Notices, and Well Completion forms.

Several states have developed Memoranda of Understanding (MOUs) between the federal and state agencies covering inspections of oil and gas operations. DOE and CWG hope that these MOUs will serve as models for other states.

CWG submitted recommendations to Interior Secretary Bruce Babbitt last September. Included was a program to eliminate duplication



CWG Interrelationships

WHAT IS IOGCC?

ORGANIZATION AND HISTORY

by Deborah A. Pratt, BDM-Oklahoma

in downhole regulation and a program to establish and maintain a common resource database. DOI will review all of its departmental regulations, procedures, and existing agreements with the state oil and gas regulatory commissions. Furthermore, DOI will either amend these procedures or create new agreements to ensure that all orders and decisions involving the areas of concern cited by CWG are addressed.

DOI expressed concern over parallel (duplicate) hearings and established an interagency task force to explore the consolidation of DOI agency databases. DOE is pleased that DOI received CWG's recommendations favorably and appears to be willing to cooperate and address some of these long-standing issues.

LOOKING INTO INCREASING STATE RESPONSIBILITIES

Recently, the IOGCC's Public Land's Standing Committee established a workgroup to evaluate the possibility of transferring oil and gas inspection and enforcement responsibilities from BLM to the states. The decision to pursue this comes in the wake of Vice President Al Gore's draft report on Reinventing Government II, which called for transferring production verification and environmental compliance responsibilities to individual states and Indian tribes. DOE and other participants in the Public Lands Project are very optimistic about the future of this effort to increase regulatory efficiency.

The U.S. Constitution gives states the right to compact (or agree to work together) to resolve common issues. In 1935, six states endorsed and Congress ratified the Interstate Compact to Conserve Oil and Gas, resulting in the formation of the unique governmental entity now known as the *Interstate Oil and Gas Compact Commission* (IOGCC). States took this action to control unregulated petroleum overproduction and resulting waste.

IOGCC today represents the governors of 36 states—29 members and 7 associate states—that produce virtually all the domestic oil and natural gas in the United States. Since its creation, IOGCC has assisted states in balancing a multitude of interests—maximizing domestic oil and natural gas production, minimizing the waste of irreplaceable natural resources, and protecting human and environmental health—through sound regulatory practices.

States regulate the oil and natural gas industry through a variety of IOGCC programs designed to gather and share information, technologies, and regulatory

methods. At quarterly IOGCC meetings across the United States, committees offer presentations and discussion on vital issues. Standing committees include:

- Energy Resources
- Enhanced Recovery
- Environmental Affairs
- Legal
- Public Lands
- Public Outreach
- Regulatory Practices
- Research

A key result of the meetings is the writing and approval of IOGCC resolutions, which state the organization's action plan for emerging issues.

IOGCC offers a highly effective forum for the states, industry, environmentalists, the federal government, and others to share information and viewpoints, allowing members to take the initiative on dealing with emerging technologies and environmental issues. DOE selected IOGCC to assist in the development and implementation of its regulatory streamlining program. For more information on IOGCC, please contact the Oklahoma City office at 405-525-3556.

IOGCC EXECUTIVE COMMITTEE

Chairman	Governor E. Benjamin Nelson	Nebraska
Vice-Chairman	Barry Williamson	Texas
2nd Vice-Chairman	James A. Slutz	Indiana
Executive Director	Christine Hansen	Oklahoma
Chairman-Elect 1997	Governor Frank Keating	Oklahoma

MANAGEMENT OF GAS-RELATED PRODUCED WATER AND WASTE*

by Viola Rawn-Schatzinger, BDM-Oklahoma

The development of cost-effective, technically sound, and acceptable environmental approaches to the disposal of produced water and wastes generated by the natural gas industry is the goal of a joint project sponsored by the Gas Research Institute (GRI) and the Department of Energy (DOE). Produced water is the largest form of waste produced in the oil and gas industry. It is regulated by federal and state laws, including the Safe Drinking Water Act, the Clean Water Act, and the Resource Conservation and Recovery Act.

PROJECT OBJECTIVES

Objectives of the project are:

- Establish the occurrence and distribution of natural gas-related produced water
- Establish production volumes for gas-related produced water
- Summarize data on chemical characteristics by region
- Describe management options, focusing on Class II injection wells
- Develop databases for storage, manipulation and assessment of these data

An initial phase of the study was

a detailed survey and assessment of data on gas-related produced water for 1990.[†] In 1990, 497 million bbl of gas-related produced water were generated, 79% from onshore sites, 22% from offshore sites, and less than 1% from Alaska.

PRODUCED WATER

Produced water is mainly reservoir water, but may also contain fluids from well treatment and completions, workover fluids, and concentrations of chemicals. Produced water composition varies greatly by region, characterized by concentrations of inorganic salts (chloride, sodium, and calcium) with trace amounts of hydrocarbons

and metals. Benzene and toluene are the most common petroleum hydrocarbons found in produced water.

In 1989, 56% of the produced water was handled with Class II injection (saltwater disposal [SWD]) wells, and 29% was discharged. Discharge operations were primarily in the Gulf Coast of Louisiana and the Black Warrior Basin of Alabama (Figure 1).

A 1991 Louisiana ruling banning most surface discharge significantly increased the percentage of produced water disposed of by Class II injection wells. Class II injection wells are used for onshore sites and Alaskan wells, whereas discharge

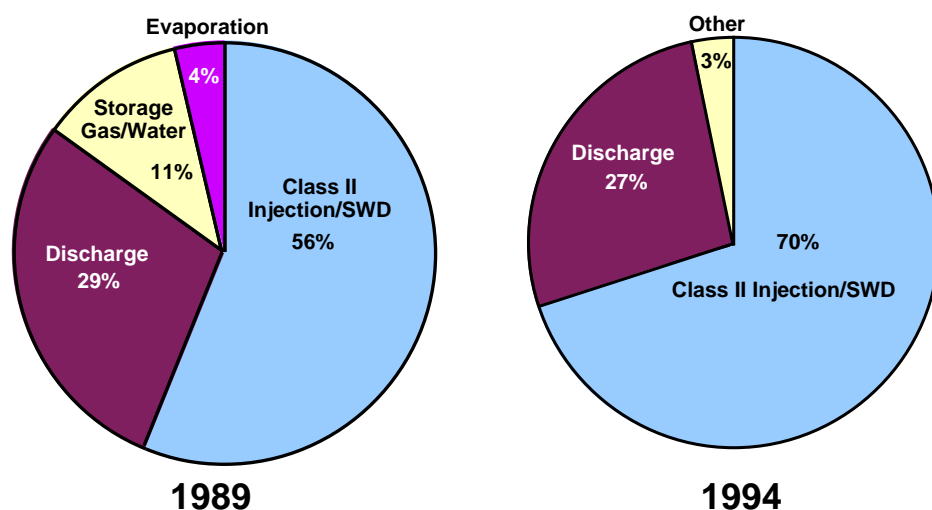


Figure 1 Means of disposal showing changes with time due to new regulations.

* Data provided by James Evans and Gas Research Institute.

† From Daly, D. J., R. S. Stoa, S. A. Bassingthwaite, J. A. Sorensen, D. S. Charlton, G. Mesing and J. M. Evans, 1995, "Gas Industry-Related Exploration and Production Waste 'Demographics' Utilizing GIS," SPE paper 29720 presented at the SPE/EPA Exploration & Production Environmental Conference, Houston, TX.

Figure 2 Percentage of completion costs attributed to waste management in selected basins (modified from Daly et al. 1995).

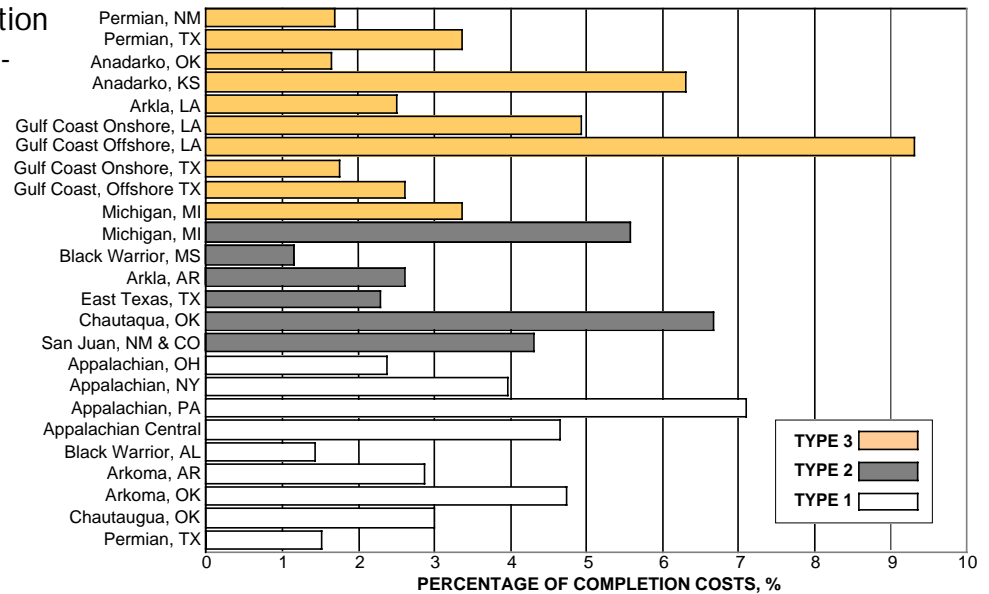
has dominated the offshore sites and a few selected onshore regions. Class II wells dominate in the Anadarko, Arkoma, East Texas, Permian, and San Juan basins and are important in the northern Appalachian, Arkla, and Mid-Gulf Coast basins.

The cost of gas-related SWD wells—including installation, operation, and disposal—differs from region to region. Disposal costs are affected by availability of disposal sites, methods and distance of transport of produced water, and local regulations. Produced well completion costs, including disposal, are similar to well installation costs on a per foot basis. Installations ranged from \$27,500 for a shallow well in the Appalachian Basin to more than \$1 million for wells in the San Juan and Gulf Coast basins. Excluding the Gulf Coast Basin, produced water disposal for on-site wells in 1990 averaged \$352 per producing well for on-site wells and \$1,728 per producing well off-site. The Sacramento and Appalachian basins had relatively high off-site disposal costs because of transportation and limited availability of SWD disposal sites.

PRODUCED WASTE

Production wastes are divided into three types:

- Type 1—Waste resulting from cuttings from air rotary drilling (ARD)



- Type 2—Waste resulting from lightly treated drilling fluids from liquid rotary drilling (LRD)
- Type 3—Waste resulting from heavily treated freshwater, saline, and oil-based systems and emulsions from LRD and evaporite layers downhole

ARD systems, used more frequently in oil drilling, produce only 5% of gas-related drilling wastes. ARD dominates in the Appalachian Basin, Arkoma Basin, and Val Verde part of the Permian Basin. LRD systems account for 62% of completions and produce 95% of gas-related drilling waste. Type 2 waste accounts for 26% of the completions and is dominant in the East Texas, Arkoma, San Juan, Michigan, and Denver basins. Type 3 waste is dominant in the Gulf Coast and Anadarko basins and part of the Permian Basin. Type 3 waste accounts for 58% of gas-related drilling waste.

Type 1 and some Type 2 wastes are managed on-site by holding in “reserve pits” prior to site reclamation. Type 3 wastes and all wastes in environmentally sensitive areas (such as basins in California and the Gulf Coast) contain cuttings and liquids in closed-loop systems in steel tanks. Costs per barrel ranged from \$0.54 to \$22, averaging \$2.86. Except for the Louisiana Gulf Coast region, costs average less than \$5/bbl. Higher costs were associated with Type 3 waste, and off-site transportation of fluids in the Gulf Coast, Michigan, East Texas, and Arkla basins. A comparison of waste disposal costs as a percentage of completion costs by region is based on waste type (Figure 2).

Management of waste disposal accounted for 1–10% of total well completion costs. Overall gas-related drilling waste management costs were estimated at \$125 million for 1990.

LOWER COST OF PRODUCED WATER DISPOSAL IN THE GULF COAST*

by Mark Young, BDM-Oklahoma

Produced water is the largest generated waste stream by volume in the Gulf Coast region. In 1991, Louisiana produced over 1 billion and Texas produced 7.5 billion bbl of water, as a result of oil and gas operations. More than 254 million bbl of produced water were discharged to surface waters in both Texas and Louisiana.

DIRECT DISCHARGE UNDER INCREASING SCRUTINY

Direct discharge of produced water to surface waters has been a widely used disposal method in the Gulf Coast region since production began there. Because of the tremendous volume of water generated and the specific constituents typically present, produced water from oil and gas production operations has been increasingly scrutinized in recent years for the potential impacts on surrounding, often sensitive habitats. The U.S. Department of Energy (DOE) sponsored a project to identify the effects of Environmental Protection Agency (EPA) regulations on disposal of produced water and analysis of the technologies to handle the problems.

The regulations which impact the

discharge or disposal of produced water focus mainly on the concentrations of oil, heavy metals, radionuclides, and treating chemicals in the waste stream. Salinity is typically not a concern since produced water, although highly saline, can be greatly diluted in the ambient water of the Gulf Coast region.

The EPA is the primary federal authority over produced water discharges. The Louisiana Department of Environmental Quality and the Texas Railroad Commission have regulatory authority over the oil and gas industry in their states. The oil and grease concentration in produced water for Texas and Louisiana will be limited by the latest EPA regulation to a maximum for any one day of 42 mg/liter and an average daily value for 30 consecutive days of 29 mg/liter.

EFFECT OF ZERO DISCHARGE

As a result of these regulations, the industry has been left with limited options for produced water disposal. The most cost-effective and widely used technology is to inject produced water into subsurface formations for disposal. The American Petroleum Institute estimated in March 1995 that the

initial cost for compliance with the zero discharge guidelines would be \$289 million for coastal areas and over \$3.2 billion for offshore areas. Zero discharge will dramatically increase the operating costs for produced water disposal in the Gulf Coast region and significantly limit the economic life of producing wells and fields.

TECHNOLOGY CHOICES

Traditional treatment and disposal of produced water has been limited to settling tanks and reinjection. Newer technologies for contaminant removal include hydrocyclones, reverse osmosis, membrane filtration, gas flotation, and activated carbon absorption. The most promising technologies for consideration in research-scale demonstrations include, in order of priority:

- Media filtration systems that specialize in removal of colloidal, turbid, and microparticles (including radionuclides and heavy metals)
- Bioreactors that are designed to work in tanks (but currently cannot handle large volumes of water)
- Membrane filtration systems that are designed for liquid separation and water filtration, and have new refinements to eliminate the clogging problems noted in the past.

* This article is based on a report by M.A. Young, P. M. Navratil, and J. S. Jones entitled *Lower Cost Produced Water Disposal in the Gulf Coast Region*, December 1995, NIPER/BDM-0207, U. S. DOE, Bartlesville Project Office, Bartlesville, OK.

SAFETY AND ENVIRONMENTAL MANAGEMENT PLAN (SEMP) UPDATE

by Jerry Simmons, BDM-Oklahoma

The character of oil and gas operation on the Outer Continental Shelf is changing for the following reasons:

- Operations are moving into very deep water and farther from shore
- The number of aged platforms is increasing
- An increasing number of smaller companies owning and operating facilities on the OCS may lack the financial capability, experience, and incentive to operate facilities in a manner historically enjoyed by major oil companies

The American Petroleum Institute Offshore Operators Committee developed RP75 as an alternative to more regulations from the Minerals Management Service. The target group for RP75 and the Safety and Environmental Management Plan (SEMP) is all operators on the Outer Continental Shelf, with emphasis on the about 100 small independent producers operating on platforms there. Unlike a typical major oil company that may own dozens of platforms and operate with their own personnel, small operators often own just one platform and hire a contractor to operate it.

In 1995, Taylor Energy subcontracted with BDM-Oklahoma to develop a SEMP for five of its

Outer Continental Shelf operations in the Gulf Coast. The goal of this demonstration project is to determine the cost and effort required by small- to medium-sized operators to improve resource recovery, profitability, facility and personnel safety, and environmental protection.

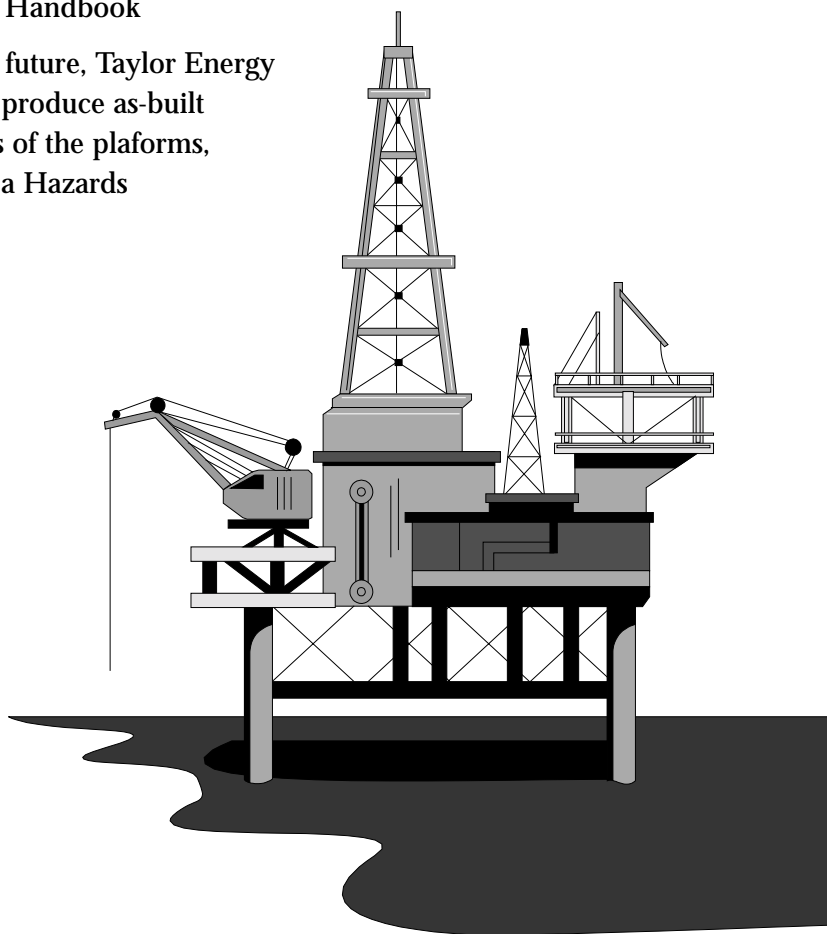
Taylor Energy has already written these manuals:

- Safe Operating Procedures Manual
- Safe Drilling and Workover Practices Manual
- Safety Handbook

In the future, Taylor Energy will also produce as-built drawings of the platforms, perform a Hazards

Analysis, and develop written operating procedures for each separate platform. Training programs will be implemented. The SEMP project is scheduled for completion in September 1997.

To obtain a copy of the procedures manuals and safety handbook, contact Gerald Von Antz with Taylor Energy at 504-581-5491.





CALENDAR

JUNE 9-12

SPE International Conference on Health, Safety, & Environment in Oil and Gas Exploration & Production, New Orleans, LA. Phone 214-952-9435.

JUNE 10-12

Environmental Geotechnology, International Symposium,

San Diego, CA. Contact Eleanor Nothelfer, Fritz Engineering Lab., Lehigh University, Bethlehem, PA 18015-3176. Phone 610-758-3549.

SEPTEMBER 9-13

IOGCC Fall Quarterly Meeting, Omaha, NE. Phone 405-525-3556.

SEPTEMBER 24-27

Third Annual International Petroleum Environmental Conference Issues and Solutions in Exploration, Production and Refining, Albuquerque, NM. Contact Pat Hall, Div. of Cont. Education, University of Tulsa, 600 S. College Ave., Tulsa, OK 74104-3189. Phone 918-631-3003.

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